IMPACT OF HIGH PRESSURE ON THE STRUCTURE AND ELECTRICAL PROPERTIES OF LITHIUM VANADATE PHOSPHATE GLASS AND GLASS-CERAMICS

Łukasz Przeszłowski[1], Krzysztof Gadomski[1], Tomasz Pietrzak[1]

[1]Warsaw University of Technology, Faculty of Physics, Solid State Ionics Division, Warsaw, Poland
lukasz.przeszlowski.stud@pw.edu.pl

$LiVOPO_4$ is a promising material for battery cathodes because it can store a relatively large amount of electric charge. However, it conducts electricity poorly, which limits its practical use.

In this work, we investigate the electrical properties of $LiVOPO_4$ in glassy and glass-ceramic forms obtained by controlled thermal nanocrystallization. This synthesis approach has been systematically developed and optimized in our group over several years.

Phase formation in the synthesized materials was verified by X-ray diffraction (XRD). Thermal behavior, including glass transition and crystallization processes, was analyzed using differential thermal analysis (DTA) up to 700 °C.

To further modify the structure and enhance electrical conductivity, the samples were subjected to ultrahigh pressure and high temperature treatment (HPHT). The results reveal how extreme thermodynamic conditions influence the structure and electrical transport properties of $LiVOPO_4$-based materials.